FE1/E1 Adapter Module
Supplement

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Bay Networks

Bay Networks

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Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy. If it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

European Requirements Only

EN 55 022 Statement

This is to certify that the Bay Networks BayStack router is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022 Class A (CISPR 22).

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

EC Declaration of Conformity

This product conforms (or these products conform) to the provisions of Council Directive 89/336/EEC and 73/23/EEC. The Declaration of Conformity is available on the Bay Networks World Wide Web site at www.baynetworks.com.

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Canada Requirements Only

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (BayStack router) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (BayStack router) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Canada CS-03 Rules and Regulations

Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user’s satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: For equipment using loopstart lines, please note that the Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement

that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5. The REN is located on the “FCC Rules Part 68” label located on the bracket of the module, or on the back of the unit.

Canada CS-03 -- Règles et règlements

Avis: L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

Avertissement: L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

Avis: Veuillez prendre note que pour tout appareillage supportant des lignes de type “loopstart,” l'indice d'équivalence de la sonnerie (IES) assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface. La terminaison d'une interface téléphonique peut consister en une combinaison de quelques dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5. Le REN figure sur l’étiquette “FCC Rules Part 68” située sur le support du module ou à l’arrière de l’unité.

FCC Part 68 Compliance Statement

This equipment complies with Part 68 of FCC Rules. All direct connections to telephone network lines must be made using standard plugs and jacks compliant with FCC Part 68. Please note the following:

1. You are required to request service from the telephone company before you connect the unit to a network. When you request service, you must provide the telephone company with the following data:
   - When you request T1 Service, you must provide the telephone company with
     -- The Facility Interface Code

        Provide the telephone company with all the codes below:

        - 04DU9-BN (1.544 MB, D4 framing format)
        - 04DU9-DN (1.544 MB, D4 framing format with B8ZF coding)
        - 04DU9-1KN (1.544 MB, ESF framing format)
        - 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)
        - 04DU9-1ZN (1.544 MB, ANSI ESF and ZBTSI without line power)

        The telephone company will select the code it has available.

     -- The Service Order Code(s) (SOC): 6.0F

     -- The required Universal Service Order Code (USOC) jack: RJ48C
   - When you request 56K/64K Service, you must provide the telephone company with
     -- The Facility Interface Code: 04DU5-56/64

     -- The Service Order Code(s) (SOC): 6.0F

     -- The required Universal Service Order Code (USOC) jack: RJ48S

- When you request V.34 Service, you must provide the telephone company with
  - -- The required Universal Service Order Code (USOC) jack: RJ11C
  - -- The make, model number, Ringer Equivalence Number (REN), and FCC Registration number of the unit

  The REN helps you determine the number of devices you can connect to your telephone line and still have all of those devices ring when your number is called. In most, but not all, areas, the sum of the RENs of all devices should not exceed 5.0. To be certain of the number of devices you can connect to your line, you should call your local telephone company to determine the maximum REN for your calling area.
- When you request ISDN "U" Interface Service, you must provide the telephone company with
  - -- The Facility Interface Code: 02IS5
  - -- The Service Order Code(s) (SOC): 6.0F
  - -- The required Universal Service Order Code (USOC) jack: RJ49C
- When you request ISDN "S/T" Interface Service, you must provide the telephone company with
  - -- The Service Order Code(s) (SOC): 6.0N
  - -- The make, model number, and FCC Registration number of the NT1

  Note: ISDN S/T cannot be directly connected to the network.
- When you request Primary Rate ISDN Service, you must provide the telephone company with
  - -- The Facility Interface Code: 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)
  - -- The Service Order Code(s) (SOC): 6.0F
  - -- The required Universal Service Order Code (USOC) jack: RJ48C

2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify you in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.
3. If the unit causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the unit, please contact the Bay Networks Technical Solutions Center in your area for service or repairs. Repairs should be performed only by service personnel authorized by Bay Networks, Inc.

United States	1-800-2LAN-WAN
Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5402-0180

5. You are required to notify the telephone company when you disconnect the unit from the network.

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About This Guide

If you are responsible for installing an El/FE1 WAN adapter module in a BayStack™ Access Node (AN®), Access Node Hub (ANH™), or Advanced Remote Node™ (ARN™) router, you need to read this guide.

Conventions

bold text	Indicates text that you need to enter, command names, and buttons in menu paths. Example: Enter **wfsm &**
	Example: Use the **dinfo** command.
	Example: ATM DXI > Interfaces > **PVCs** identifies the PVCs button in the window that appears when you select the Interfaces option from the ATM DXI menu.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.

Acronyms

FE1	fractional E1
LED	light-emitting diode
PROM	programmable read-only memory
WAN	wide area network

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Region	Telephone number	Fax number
United States and Canada	800-2LANWAN; then enter Express Routing Code (ERC) 290, when prompted, to purchase or renew a service contract 978-916-8880 (direct)	978-916-3514
Europe	33-4-92-96-69-66	33-4-92-96-69-96
Asia/Pacific	61-2-9927-8888	61-2-9927-8899
Latin America	561-988-7661	561-988-7550

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Billerica, MA	800-2LANWAN	978-916-3514
Santa Clara, CA	800-2LANWAN	408-495-1188
Valbonne, France	33-4-92-96-69-68	33-4-92-96-69-98
Sydney, Australia	61-2-9927-8800	61-2-9927-8811
Tokyo, Japan	81-3-5402-0180	81-3-5402-0173

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Europe, Middle East, and Africa	33-4-92-96-15-83
Asia/Pacific	61-2-9927-8822
Tokyo and Japan	81-3-5402-7041

Installing the E1/FE1 WAN Adapter Module

This document describes the steps for installing an E1/FE1 WAN adapter module in a BayStack ARN, AN, or ANH router.

Warning: The E1/FE1 WAN adapter module is designed to operate only in these BayStack routers. Attempting to use the E1/FE1 WAN adapter module in any other product may be hazardous and invalidates the regulatory approval.

For details of the preinstallation and installation procedures, see the companion guide for your router, which is included with your upgrade kit:

- *Installing a WAN Adapter Module in a BayStack AN or ANH Router*
- *Installing a WAN Adapter Module in a BayStack ARN Router*

Installing the E1/FE1 Module

Before starting the installation procedure, make sure that you have performed all preinstallation tasks described in your router's adapter module installation guide.

To install the E1/FE1 WAN adapter module:

1. **Install the adapter module in an appropriate WAN module slot on the router.**
   - For an ARN, use one of the two front-panel WAN module slots (Figure 1).

     See *Installing a WAN Adapter Module in a BayStack ARN Router.*

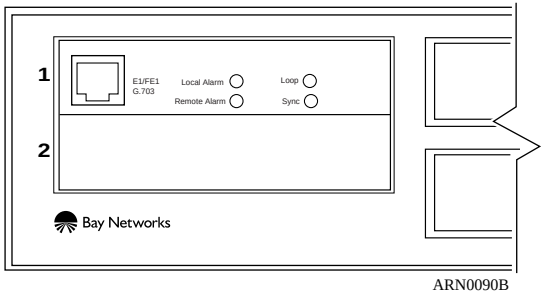

Figure 1. E1/FE1 WAN Adapter Module Connector on an ARN

- For an AN or 12-port ANH router, install the E1/FE1 WAN adapter module in the back-panel WAN module slot 3 (Figure 2).

  See *Installing a WAN Adapter Module in a BayStack AN or ANH Router.*

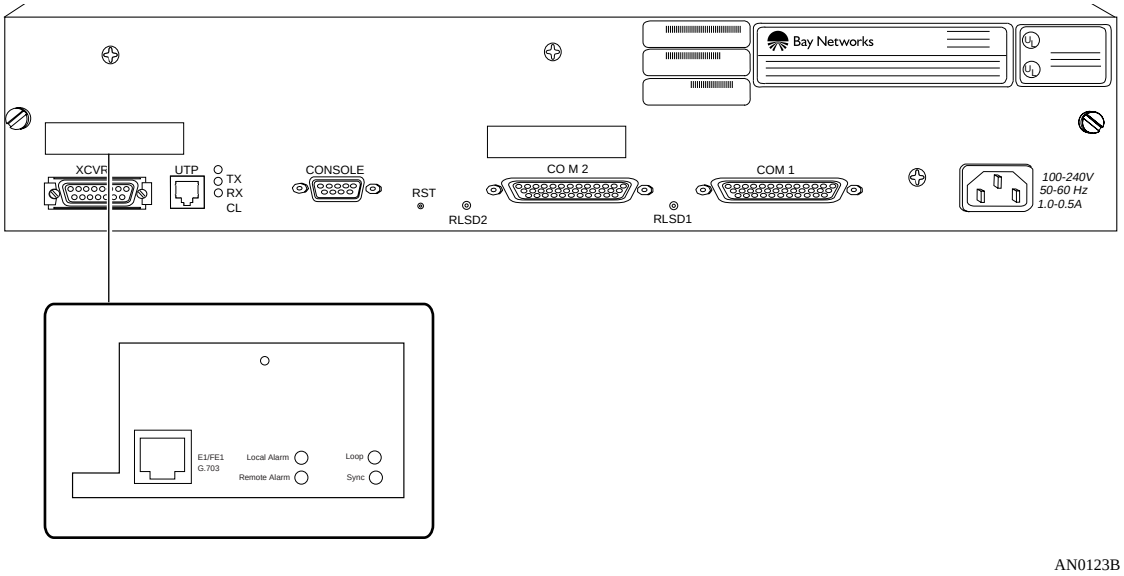

Figure 2. E1/FE1 WAN Adapter Module Connector on an AN or 12-Port ANH

- For an 8-port ANH router, install the E1/FE1 WAN adapter module in the back-panel WAN module slot 3 (Figure 3).

  See *Installing a WAN Adapter Module in a BayStack AN or ANH Router.*

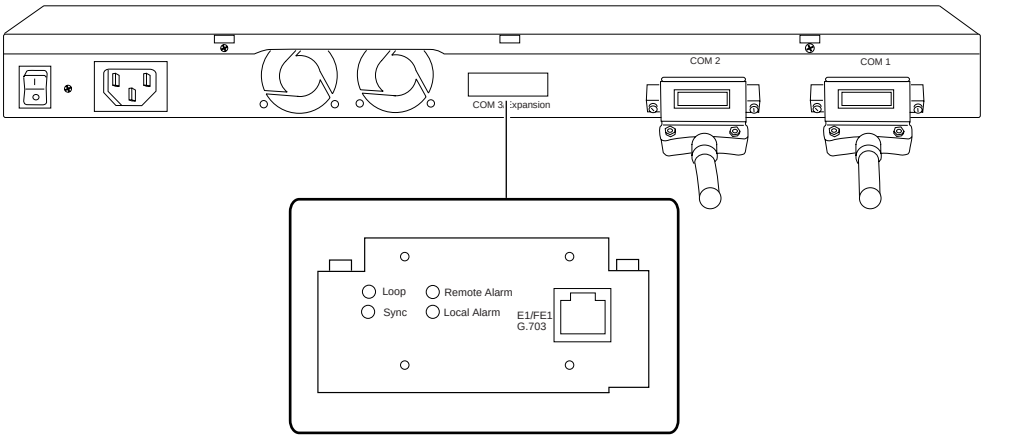

Figure 3. E1/FE1 WAN Adapter Module Connector on an 8-Port ANH

2. **Connect the E1/FE1 cable to the RJ-48C connector in the installed E1/FE1 WAN adapter module (Figure 4).**

Note: The E1/FE1 input port shall operate with an interconnecting cable loss within the range of 0 to 6 decibels (dB), measured at 1024 kilohertz (kHz).

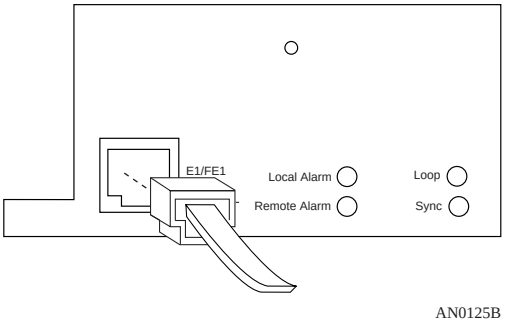

Figure 4. Cable Connection for the E1/FE1 WAN Adapter Module

3. **Connect the other end of the cable to the E1 communication device.**

   See the Bay Networks *Cable Guide*.

Verifying the Installation

After reconnecting the router to the network, verify the installation by checking the diagnostic LEDs on the base module. See *Installing a WAN Adapter Module in a BayStack ARN Router* or *Installing a WAN Adapter Module in a BayStack AN or ANH Router* for base module LED descriptions.

E1/FE1 WAN Adapter Module LEDs

The E1/FE1 WAN adapter module has four LEDs.

On ARN, AN, and 12-port ANH routers, the LEDs are to the right of the RJ-48C connector (see Figure 4). On the 8-port ANH router, the LEDs are to the left of the connector (see Figure 3). The LEDs are identical in label, color, and function on each platform.

Table 1 describes the function of each E1/FE1 LED.

Table 1. E1/FE1 WAN Adapter Module LEDs

Label	Color	Meaning
Local Alarm	Amber	Lights when the E1 port is in a local alarm state.
Remote Alarm	Amber	Lights when the E1 port has received a remote alarm from the E1 network.
Loop	Amber	Lights when the E1 interface is placed in loopback mode.
Sync	Green	Lights when the E1 port is synchronized with the E1 network.

Upgrading PROM Diagnostic and Boot Code

Table 2 shows the version and location of programmable read-only memory (PROM) boot and diagnostic code required for the E1/FE1 WAN adapter module.

Table 2. PROM Diagnostic and Boot Code for the E1/FE1 Module

Router Type	Code Type	Version	Directory	File Name
ARN	Boot	1.20	arn_proms	arnboot.exe
	Diagnostic	2.06	arn_proms	arndiag.exe
AN/ANH	Boot	9.00c	an_proms	anboot.exe
	Diagnostic	7.32	an_proms	andiag.exe

See the *BayRS Version 12.20 Document Change Notice* and *Upgrading Routers from Version 7-11.xx to 12.00* for information about upgrading PROM code.

Completing the Installation

Before you can use the E1/FE1 WAN adapter module after installation, you must start the router on the network and modify its configuration file to include the E1/FE1 WAN interface.

- To start an AN or ANH router after installing the E1/FE1 WAN adapter module, see *Installing and Operating BayStack AN and ANH Routers*. For an ARN router, see *Installing and Operating BayStack ARN Routers.*

Note: The only boot/startup methods you can use from the E1/FE1 WAN adapter module interface are Local Boot and EZ-Install. The E1/FE1 WAN adapter module does not support Netboot or Directed Netboot.

- To configure E1/FE1 WAN services, see *Configuring WAN Line Services* and *Configuring BayStack Remote Access*. Also, see any Release Notes or Document Change Notice distributed with your upgrade kit.

Note: Adding software for the WAN adapter module may increase the router's memory requirements beyond its current capacity. If the BayStack router experiences a memory problem, see the section "Memory or Buffer Problem" in *Troubleshooting Routers*. For information about changing the router image, see *Configuring and Managing Routers with Site Manager.*